CLAIMS

What Is Claimed Is:

1. A device for measuring temperature, the device comprising:

a housing;

a temperature-responsive element supported relative to the housing, the element operable to sense temperature and move in response to temperature changes;

a first inductive assembly component fixed relative to the housing; and

a second inductive assembly component operatively and movably positioned relative to the first inductive assembly component, the second inductive assembly component being driven by movement of the temperature-responsive element, the movement of the second inductive assembly component relative to the first inductive assembly component generating a change in a local eddy current pattern corresponding to the sensed temperature.

2. The device of claim 1, wherein a current at a particular point in a sensing circuit is proportional to the temperature changes causing the temperature-responsive element to move.

3. The device of claim 1, further comprising a circuit board comprising the first inductive assembly component.

4. The device of claim 3, wherein the circuit board comprises a processor responsive to generated eddy current patterns to generate a signal representative of sensed temperature.

5. The device of claim 4, wherein the processor determines the movement of the temperature-responsive element based on the generated eddy current patterns and associates the movement with a temperature to generate the signal.

6. The device of claim 1, wherein the temperature-responsive element comprises a first portion generally fixed relative to the housing and a second portion displaceable relative to the first portion, wherein the second portion drives the second inductive assembly component.

7. The device of claim 6, further comprising a visual indicator movably positioned relative to the housing and driven by the second portion of the temperature-responsive element to indicate temperature.

8. The device of claim 1, wherein the second inductive assembly component comprises a gear with a pitch ratio larger than that of the temperature-responsive element.

9. The device of claim 8, wherein the gear comprises a protuberance that operates as an inductive target in the inductive assembly.

10. The device of claim 8, wherein the pitch ratio of the gear is approximately fifteen times larger than that of the temperature responsive element.

11. A device for measuring temperature, the device comprising:

a coil operable to displace in response to changes in temperature of a medium for which a temperature is to be sensed;

a rotatable shaft driven by the temperature-responsive coil;

an inductive target displaceable by the rotatable shaft; and

an inductor positioned relative to the inductive target such that displacement of the inductive target by the rotatable shaft generates a change in a local eddy current pattern corresponding to the temperature to be sensed.

12. The device of claim 11, wherein the inductive target is rotatable with the rotatable shaft.

13. The device of claim 12, further comprising a circuit board comprising an opening through which the rotatable shaft extends, wherein the circuit board comprises the inductor.

14. The device of claim 13, wherein the inductive target rotates in a plane generally parallel to the circuit board.

15. The device of claim 13, further comprising:

a pointer coupled to the rotatable shaft; and

an indicia plate fixed relative to the pointer such that the pointer rotates in a plane generally parallel to the indicia plate to indicate temperature.

16. The device of claim 15, wherein the inductive target is positioned between the indicia plate and the circuit board.

17. The device of claim 11, wherein the coil is a bimetallic coil comprising a proximal end driving the rotatable shaft.

18. The device of claim 11, wherein the inductive target comprises a plurality of radial features extending transversely relative to a longitudinal axis of the rotatable shaft.

19. The device of claim 11, further comprising a microprocessor responsive to generated eddy current patterns to generate a signal representative of sensed temperature.

20. The device of claim 19, wherein the microprocessor determines the movement of the shaft based on generated eddy current patterns and associates the movement with a temperature to generate the signal.

21. The device of claim 11, wherein the inductive target comprises a gear with a pitch ratio larger than that of the rotatable shaft.

22. The device of claim 21, wherein the gear comprises a protuberance that operates as the inductive target.

23. The device of claim 21, wherein the pitch ratio of the gear is approximately fifteen times larger than that of the rotatable shaft.

24. A method performed at a temperature measurement device, the method comprising:

sensing a temperature change;

converting the sensed temperature change to mechanical movement;

converting the mechanical movement to an electrical signal representing the movement by induction;

detecting the electrical signal; and

determining the mechanical movement based on the electrical signal.

25. The method of claim 24, wherein converting the sensed temperature change to mechanical movement comprises rotating a shaft in response to the sensed temperature change.

26. The method of claim 24, wherein converting the mechanical movement to an electrical signal representing the movement by induction comprises moving an inductive target relative to an inductor, the movement generating a change in an eddy current pattern.

27. The method of claim 26, wherein moving an inductive target comprises driving the inductive target with a gear that has a pitch ratio less than that of the inductive target.

28. The method of claim 24, further comprising determining a temperature associated with the mechanical movement.

29. The method of claim 28, further comprising generating a signal representing the temperature.

30. The method of claim 28, wherein determining a temperature associated with the mechanical movement comprises determining the amount of mechanical movement.

31. A device for measuring temperature, the device comprising:

means for sensing a temperature change;

means for converting the sensed temperature change to mechanical movement;

means for converting the mechanical movement to an electrical signal representing the movement by induction;

means for detecting the electrical signal; and

means for determining the mechanical movement based on the electrical signal.

32. The device of claim 31, wherein converting the sensed temperature change to mechanical movement comprises rotating a shaft in response to the sensed temperature change.

33. The device of claim 31, wherein converting the mechanical movement to an electrical signal representing the movement by induction comprises moving an inductive target relative to an inductor, the movement generating a change in an eddy current pattern.

34. The device of claim 33, wherein the inductive target has a pitch ratio substantially smaller than a driving means.

35. The device of claim 31, wherein the determining means is further operable to determine a temperature associated with the mechanical movement.

36. The device of claim 35, wherein determining a temperature associated with the mechanical movement comprises determining the amount of mechanical movement.

37. The device of claim 31, wherein the determining means is further operable to generate a signal representing the temperature.

38. A device for measuring temperature, the device comprising:

a transducer comprising:

a temperature-responsive, bimetallic coil positioned to displace in response to changes in temperature of a medium for which a temperature is to be sensed, and

a rotatable shaft coupled to a second end of the coil, the shaft rotatably driven by the coil;

an inductive target coupled to the shaft and rotated thereby, the target comprising a plurality of radial features extending transversely relative to a longitudinal axis of the rotatable shaft;

a circuit board comprising an opening through which the rotatable shaft extends, the circuit board further comprising:

an inductor positioned relative to the inductive target such that rotation of the inductive target by the shaft generates a change in a local eddy current pattern representing the shaft rotation, and

a microprocessor responsive to generated eddy current patterns to determine the rotation of the shaft, to associate the rotation with a temperature, and to generate an electrical signal representative of sensed temperature; and

a visual indicator comprising:

an indicia plate generally parallel to the circuit board, and

a pointer fixed to the rotatable shaft relative to the indicia plate to indicate temperature, wherein the inductive target is positioned between the indicia plate and the circuit board and the pointer rotates in a plane generally parallel to the indicia plate.